Human Exploration and Development of Space Performance Targets and Indicators

Target 1H1: Complete testing and delivery for spacecraft integration of experiments for the Mars Surveyor Program 2001 orbiter and lander missions.

- Complete testing and delivery for spacecraft integration for the radiation monitoring experiment hardware (MARIE)
- Complete testing and delivery for spacecraft integration for the soil and dust analysis experiment (MECA)
- Complete testing and delivery for spacecraft integration for the Mars In-Situ Propellant Production Precursor experiment (MIP)

Target 1H2: Complete initial next decade planning mission architecture studies and technology plans.

- Complete initial next decade planning mission architecture studies

Target 1H32: Initiate the HEDS Technology/Commercialization program and establish a synergistic relationship with industry.

- Indicator is a successful response to the initial NASA Research Announcement, with a 50% cost share from industry, where appropriate.

Target 1H3: Support an expanded, productive research community to include 975 investigations annually by 2001.

- Expand support to approximately 975 investigations (from 877 reported in FY 99).
- Publish abstracts and reports of progress for over 90% of FY 2000 research investigations (tasks) and make this publication available on the Internet.
- Support publication of approximately 1500 journal articles in refereed journals.
- Support emergent microgravity research programs in biophysics and tissue engineering by selecting up to 10 new investigations.

Target 1H4: Conduct outstanding peer-reviewed and commercial research on STS 107 to advance knowledge in the fields of medicine, fundamental biology, biotechnology, fluid physics, materials processing and combustion.

- Acquire unique data to improve crew health and safety and expand understanding in biology, biotechnology cell science, fluid physics, and combustion science.

Target 1H5: Begin research on the International Space Station.

- Increase fundamental knowledge in biological and biomedical sciences and address critical questions in crew health and safety by conducting 6 to 10 ISS investigations

- Acquire unique data on colloidal self-assembly as an essential first step in the synthesis of new materials from colloidal particles.
- Measure the ISS acceleration environment, develop models to characterize the effects of that environment on ISS research, and disseminate those results to the ISS investigator community.

Target 1H6: Expedite a safety improvement program to ensure the continued safe operations of the Space Shuttle that ensures the availability of a safe and reliable Shuttle system to support Space Station Assembly milestones and operations.

- CLCS application for the Orbiter Processing Facilities is completed.

Target 1H7: Achieve 8 or fewer flight anomalies per mission.

- Achieve 8 or fewer flight anomalies per mission

Target 1H30: Achieve 100% on-orbit mission success

- Pre-flight mission/payload objective
- Post-flight mission report

Target: 1H10: Successfully complete the majority of the planned development schedules and milestones required to support the Multi-element Integration Testing

- Complete Multi-Element Integration Test II (MEIT) to include flight elements for assembly flights 8A through 12A. This will be measured by completion of five planned test configurations. MEIT Tests perform integration testing with several launch elements to increase on-orbit confidence.

Target: 1H11: Successfully complete the majority of the ISS planned on-orbit activities such as delivery of mass to orbit and enhanced functionality.

- Continue to expand the capabilities of the ISS through launch and delivery of 180,000 lbs. of hardware and logistics to the ISS.
- Initiate and demonstrate station-based Extravehicular Activity (EVA) capability to support up to 30 EVAs annually from the U.S. Airlock. This will be measured by completion of a minimum of 5 EVAs from the ISS Airlock.

Target: 1H12: Successfully complete the majority of combined ISS planned operations schedules and milestones as represented by permanent human on-orbit operations.

- Conduct permanent human on-orbit operations with an estimated 8,000 crew hours dedicated to assembly, vehicle operations and payload operations.

Target: 1H13: Successfully complete the majority of the planned research activities in support of initiation of on-orbit research opportunities.

- Initiate on-orbit research in the U.S. Laboratory focusing on early payload opportunities in the Human Research Facility (HRF-1) and four multipurpose EXPRESS Racks.
- Complete integration testing and KSC processing for the Microgravity Sciences Glovebox (MSG), refrigerator/freezer, and Window Observational Research Facility (WORF-1) in preparation for launch on UF-1 and UF-2. This will be measured by completion of schedule milestones.

Target: 1H14: Successfully complete no less than 85% of the planned Russian Program Assurance schedules and milestones required for the development of the Propulsion Module.

- Initiate Propulsion Module Fabrication/Assembly/Integration and Testing in preparation for launch in late FY 2002. This will be measured by completion of schedule milestones.

Target: 1H15: Successfully complete no less than 75% of the planned crew return capability schedules. FY01 indicators will include accomplishment of program schedule milestones for Phase 1 development of a crew return vehicle (CRV) that could provide the U.S. crew return capability.

- Complete Crew Return Vehicle (CRV) Phase 1 tasks including Preliminary Design Review (PDR). This will be measured by completion of schedule milestones.

Target: 1H17: Develop new biomedical and technological capabilities to facilitate living and working in space and return to Earth.

- Flight test countermeasure to reduce kidney stone risk
- Develop two new evidence-based health protective countermeasure candidates ready for evaluation in an operational setting.

Target: 1H18: Develop and demonstrate technologies for improved life support systems.

- Demonstrate, in ground test, technologies that could reduce up to 25% of life support logistics over ISS baseline and release report of progress for review on the Internet.
- Perform detailed calculation of life support equivalent system mass index and place online for review and comment. Equivalent system mass index is a measure of the performance of a life support system incorporating demonstrated technologies.

Target: 1H31: Initiate implementation of the Bioastronautics Initiative.

- Initiate NASA/NCI collaboration to develop minimally invasive technologies and approaches for detecting and interpreting biological signatures that signal the emergence of disease.
- Initiate expansion of the teams and tasks of the NSBRI for the development of countermeasures by adding approximately 15 investigations (NSBRI tasks).

Target: 1H20: Increase the percentage of the space operations budget allocated to acquisition of communications and data services from the commercial sector to 15%.

- Increase to 15% the space operations budget allocated to acquisition of commercial communications and data services from the 10% FY 2000 performance target.

Target: 1H21: Achieve at least 95 percent of planned data delivery from space flight missions as documented in space, ground, deep space, and NASA integrated service networks performance metrics consistent with detailed program and project operations requirements in project service level agreements.

- Achieve at least 95 percent data delivery for all space flight missions as documented in network performance metrics.

Target: 1H22: Establish at least ten new, active industrial partnerships to research tomorrow's space products and improve industrial processes through NASA's Commercial Centers, and find opportunities for space experiments

- Ensure that Commercial Centers execute ten new partnership agreements
- Monitor the ratio of flight experiments to ground experiments

Target: 1H23: Foster commercial endeavors by reviewing and/or implementing new policies and plans, such as the Space Station resource pricing policy and intellectual property rights policy. Ensure that Space Station resources allocated to commercial research are utilized by commercial partners to develop commercial products and improve industrial processes.

- Review and/or implement Space Station resource pricing and intellectual property rights policies.
- Ensure Space Station resources allocated to commercial research are utilized by commercial partners to research tomorrow's products and improve industrial processes.

Target: 1H26: Support participation in HEDS research.

- Enable at least 50 students to participate in commercial space flight and technologies research.
- Through the use of national teacher conferences and workshops, provide approximately 200 elementary and high school classrooms nationwide with electronic (multimedia/computer technologies) and printed materials that focus on activities in science, math and technology relating to life sciences and microgravity research and specifically written for students in grades K-12
- Complete a broadly based student competition on innovative design concepts that address HEDS technological challenges.
- Complete customer engagement plan

Cross-cutting target

Target: 1H29: Improve health of the NASA workforce

- Developing and implement supervisor-specific training for the identification and management of stress in the work unit. Develop and implement training on techniques for coping with stress for the individual employee.
- Begin a robust audit program of NASA Centers' occupational health programs, completing at least six (6) to ensure quality and continuous improvement of medical care and services including medical and environmental monitoring efforts, preventive services, emergency response capability, and clinical intervention capability.